

**Drawing Amendments**

Please amend Figure 1 of the drawings of the subject application to correct the position of the lead line associated with reference character 110. An annotated copy of Figure 1 and replacement sheet for Figure 1 is included in Appendix A.

### Discussion

The Office has rejected claims 1, 2, 5, 7, 13-15, 18, 20 and 26-28 under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of King et al. (4,408,160). Applicants contend that the rejected claims are nonobvious and patentable under 35 U.S.C. § 103(a) over Applicants' specification in view of King et al. (U.S. Patent No. 4,408,160). Applicants believe that the Office has not established a *prima facie* case for obviousness by failing to find every limitation of Applicants' rejected claims in the cited references.

Regarding the first limitation of independent claims 1, 14 and 27 (currently amended), the first limitation of claims 1, 14 and 27 recite, "creating one or more magnetic fields circumferentially positioned in a pipeline wall aligned and moving parallel with an axis of the pipeline". This limitation may be found in many pipeline inspection pigs that utilize magnetic flux leakage (MFL) techniques to measure material loss in a pipeline wall, as described in paragraph 003 of Applicants specification as filed. This turns out to be one of the advantages of the present invention, in that sensors and circuitry necessary to implement the continuous Barkhausen noise detection technique may be easily added to existing MFL inspection pigs for determining stresses in a pipeline wall surface by making use of the existing magnets in the MFL pipeline inspection pig. This enables an existing MFL pipeline inspection pig to be modified so that, in addition to measurements of material loss that may be made using MFL techniques, measurements of pipeline wall stress also may be made using continuous Barkhausen techniques. New kit claim 31, which includes the limitations found in system claim 27, has been added to the claims.

Regarding the second limitation of claims 1, 14 and 27 (currently amended), the second limitation of claims 1, 14 and 27 recite, “sensing Barkhausen noise signals by one or more magnetic sensors located at one or more surfaces of the pipeline wall near one or more transition zones created by the one or more magnetic fields where there are strong magnetic field gradients”. The Office has cited Applicants’ paragraph 0011 as admitted prior art containing this limitation. The Office is in error in citing and interpreting Applicants’ paragraph 0011 as admitted prior art. Paragraph 0011 of Applicants’ specification is contained in the SUMMARY OF INVENTION section of the specification, and comprises a broad description of what Applicants consider to be their invention. Paragraph 0011 is not admitted prior art, but comprises a summary of Applicants’ invention. The Office has failed to find this second limitation of Applicants’ rejected claims 1, 14 and 27 in the cited references, and therefore has not established a *prima facie* case for obviousness.

Regarding the third limitation of claims 1, 14 and 27 (currently amended), the third limitation of claims 1, 14 and 27 recite, “amplifying, filtering, detecting, multiplexing and storing the magnetically sensed Barkhausen noise created by the moving magnetic fields”. The Office alleges that this limitation is disclosed in the King reference. Contrary to the Office allegations, the King reference discloses a coil or electromagnet for applying a time-varying magnetic field to a specimen being tested, whereby the coil or electromagnet are positionally affixed in relation to the specimen being tested. There is no disclosure in the King reference of magnetically sensing Barkhausen noise created by moving magnetic fields. In addition, the sensor disclosed in the King reference is an acoustic transducer for detecting acoustic vibrations or sound

waves that are transmitted through the medium of the specimen and impinges on the surface of the specimen, whereas the present invention relies on a magnetic sensor for detecting magnetic fields that are generated on a surface of a pipeline wall. This third limitation of Applicants' claims 1, 14 and 27 are not disclosed in the King reference, are not admitted prior art, are not inherent, and are not obvious to one skilled in the relevant art. Furthermore, the cited art of Willems et al. (U.S. Patent No. 6,009,756) teaches away from Applicants' invention by a novel electromagnetic ultrasonic transducer method that suppresses detected Barkhausen noise in ferromagnetic material. The Office has failed to find this third limitation of Applicants' rejected claims 1, 14 and 27 in the cited references, and therefore has not established a *prima facie* case for obviousness.

Regarding the fourth limitation of claims 1, 14 and 27 (currently amended), the fourth limitation of claims 1, 14 and 27 recite, "analyzing and interpreting the stored Barkhausen noise signals in relation to corresponding positions of the inspection pig within the pipeline for determining stress magnitude and corresponding locations of stress in the pipeline wall". There is no disclosure in the King reference and there is no admitted prior art that discloses this limitation. The Office has failed to find this fourth limitation of Applicants' rejected claims 1, 14 and 27 in the cited references, and therefore has not established a *prima facie* case for obviousness.

Since the Office has failed to establish a *prima facie* case for obviousness of Applicants' independent claims 1, 14 and 27, Applicants request withdrawal of the rejections of these claims and allowance of the application.

Each claim depending on the rejected independent claims 1, 14 and 27 provides further novel and nonobvious limitations that will not be enumerated here for brevity.

Furthermore, since each of the dependent claims 2-13, 15-26, and 28-30 depend either directly or indirectly on independent claims 1, 14 and 27, respectively, which have been shown above to be novel and nonobvious, the dependent claims 2-13, 15-26, and 28-30 are also novel and nonobvious. Applicants request withdrawal of the rejections and objections of these claims and allowance of the application.

### Summary

Applicants have made a diligent effort to distinguish the present invention over the referenced art and to place the claims in condition for allowance. Applicants believe that the rejected claims, as amended, define over the reference cited in the Office Action of February 15, 2005. The amendments are fully supported by the specification as filed.

However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Douglas D. Russell, Applicants' Attorney at 512-338-4601, so that such issues may be resolved as expeditiously as possible. For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited. Reconsideration and further examination is respectfully requested.

Respectfully Submitted,

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Date

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## Appendix A

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### *Annotated Sheet Showing Changes*

**1/4**

